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tures being devoted almost exclusively to fermentation and the actions of enzymes external to the cell and not intra-cellular activities. The cytologist looks here in vain for information regarding constructive and destructive metabolism, oxidation, etc., in the cell. He finds, however, an excellent and clear exposition of the kinds of ferments and of their importance in digestion in animals and plants, and in the first lecture of this second set he finds a most excellent illustration of the cost in labor of ascertaining a single scientific fact, a concise history of the development during the last two hundred years of our knowledge of fermentation being given. The third section of three lectures entitled Recent Methods and Results in Biological Inquiry, and the last section of four lectures on Toxins and Antitoxins, contain much repetition of the earlier lectures, but we find here a valuable elaboration of the lines of research in a field where Dr. Macfadyen was familiar with every inch of the ground. Here is an excellent summary of the effects of microorganisms as agents of disease and of immunity to and prevention of disease, all as understood at the time the lectures were written and well serving as a basis for those who would study the modern developments of these important lines of biological research.

G. N. C.

SCIENTIFIC JOURNALS AND ARTICLES

The Journal of Experimental Zoology, Vol. VI., No. 2 (February, 1909), contains the following papers: "Studies on Chromosomes, V., The Chromosome-groups of Metapodius, A Contribution to the Hypothesis of the Genetic Continuity of the Chromosomes," by Edmund B. Wilson. This contains a detailed account of the "supernumerary chromosomes," which form a specific class and vary in number in different individuals of the same species. The facts are shown to form a strong support to the general theory of the genetic continuity of the chromosomes, of which a general discussion is given. "The Effects of Desiccation on the Rotifer, *Philodina roseola*," by Merkel Henry Jacobs. The old question of the possibility of revival of rotifers after a

more or less protracted desiccation is again taken up, and as a result of numerous experiments the older view that recovery is possible after a true desiccation is confirmed and the newer one that the animal at the time of drying is protected by a water-proof cyst is shown to be based on insufficient evidence. In addition, it is shown that the process of drying serves as a stimulus to reproductive activity, a definite relation existing between the periods of drying and those of egg laying. "Protozoan Studies," by J. F. McClendon. *Amœbæ* do not respond to minutely localized mechanical stimulation unless this be repeated at short intervals of time. By chemical stimulation it was found that the stimulus traveled through the *Amœba* at a rate probably faster than the movement of the fastest ions in aqueous solution. The movement of this stimulus might be compared to the nervous impulse, save that not being confined to a nerve fiber it spreads in all directions. Experiments suggested the following hypothesis of food taking by the *Amœba*: External chemical and physical processes cause a hardening and shrinking of the surface protoplasm, thus forming the ectosarc. Internal processes cause a liquefying of the protoplasm, thus forming the endosarc. Unstable equilibrium between these two sets of processes causes amœboid movements. A protoplasmic food body near the *Amœba* protects it locally from external processes and thus causes the *Amœba* to bulge out toward the food. That spot on the *Amœba* that touches the food is stimulated, hardens and ceases to advance. Therefore lateral pseudopodia are formed and surround the food. *Paramecia* were centrifuged for periods of time up to one week. The nuclei, chromatin and other heavy substances were precipitated, but returned to their normal positions in about the length of time during which they had been centrifuged. The negative geotropism returned simultaneously with return of these substances. Centrifuging stimulated division. Centrifuging produced abnormalities and these were not transmitted to both products of binary fission. *Paramecium aurelia* formed membranous cysts and while in them often absorbed its own anterior or

posterior end. These were regenerated after liberation. The encysted *Paramecia* were killed by drying. From material obtained from a number of localities *Paramecium aurelia* was found to be dimorphic as regards size and the smallest specimens smaller than the smallest of *Paramecium caudatum*. "The Artificial Production and Development of One-eyed Monsters," by Charles R. Stockard. Salts of magnesium in solution are found to cause one-eyed monsters to develop from the eggs of the fish, *Fundulus heteroclitus*. These cyclopean individuals were produced in such numbers as to afford material for a full investigation of the processes involved in the formation of the defect.

BOTANICAL NOTES

VEGETATION PICTURES

SOME years ago Professors Karsten and Schenck, the former of the University of Bonn, and the latter of the Technical High School of Darmstadt, began the publication, through Gustav Fischer, of Jena, of a most interesting work under the title of "Vegetationsbilder." From time to time the successive parts have been noticed favorably in these columns, and now the reception of "Heften" 1 and 2 of the seventh volume calls for another notice. These are devoted to the vegetation of the volcanic regions of Java and Sumatra, and were prepared by Professor A. Ernst, of the University of Zürich, and the seventeen half-tone plates were made from photographs taken by him also. These plates are admirable examples of what may be done in the way of faithful reproduction, and make one wonder why it is so difficult, or perhaps even impossible, to secure work of this kind in this country at anything less than prohibitive prices. It is difficult to single out from these striking pictures those of greatest interest, but No. 5a showing pioneer vegetation on the volcano Merapi (2,981 meters), and No. 11a showing a grass steppe in the interior of the volcano Krakatau are especially noticeable. The text, of which there are twenty-four pages, is full and satisfactory. The excellence of the work, together with its

very moderate price (2.50 Marks per heft) should make it one of the necessary works in every botanical library.

ANOTHER BOTANICAL JOURNAL

ON the first of January the well-known publisher, Gustav Fischer, of Jena, began the publication of a promising new monthly journal in the botanical field under the name *Zeitschrift für Botanik*. In size of page and number of pages for each number it resembles the *Botanical Gazette*, which in these respects was frankly taken by the projectors as the model for the new journal. The editors are Oltmanns, Solms-Laubach (who now withdrew from the *Botanische Zeitung*) and Jost, which fact is a guarantee of the high grade of the journal. This initial number consists of three parts, viz., (1) an original article of 86 pages; (2) reviews, covering 16 pages, and (3) a classified list of titles of new botanical books and papers. In the first paper there are 26 cuts, but this number contains no plates. The type and paper are good. The subscription price is fixed at 24 Marks. It will without doubt soon prove to be one of the most useful of the German botanical journals.

AMENDING THE VIENNA CODE

IN the February number of the *Bulletin of the Torrey Botanical Club* nineteen American botanists print eleven motions for amendments to the Vienna Code, and present arguments therefor. These motions are submitted "for the consideration of the International Botanical Congress to be held in Brussels in 1910." Briefly these motions cover the following points:

1 and 2. To apply these rules to fossil plants and non-vascular plants, which is not now done in the code. These appear to be desirable motions, and should be adopted.

3. To abolish the list of "Nomina conservanda," i. e., names arbitrarily conserved contrary to the principle of priority. Here the contention of the committee is sound, and ultimately the code must be so amended as to conform to it, but whether this should be insisted upon at the present time admits of argument.